WHAT IS CLAIMED IS:

1. A method of processing image data comprising the steps of:

transforming broad-range image data having a broad dynamic range to narrow-range image data narrower in dynamic range than the broad-range image data;

inversely transforming the narrow-range image data to thereby output inversely transformed image data having a same dynamic range as the broad-range image data;

calculating difference data representative of a difference between the broad-range image data and the inversely transformed image data; and

generating a file that relates at least the difference data, information relating the difference data to said step of transforming and the narrow-range image data to one another.

2. The method in accordance with claim 1, further comprising the step of recording the file.

3. The method in accordance with claim 1, wherein the broad-range image data is reproducible by adding the difference data to the inversely transformed image data.

4. The method in accordance with claim 1, wherein said step of transforming comprises the sub-step of linearly transforming a number of quantizing levels of the broad-range image data, and said step of inversely transforming comprises the sub-step of linearly, inversely transforming a number of quantizing levels of the narrow-range image data.

5. The method in accordance with claim 1, wherein said step of transforming comprises the sub-step of nonlinearly transforming a number of quantizing levels of the broad-range image data, and said step of inversely transforming comprise

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the sub-step of nonlinearly, inversely transforming a number of quantizing levels of the narrow-range image data.

6. The method in accordance with claim 1, wherein said step of transforming comprises the sub-step of reducing a number of quantizing bits of the broad-range image data sequentially from a lowermost bit until the number of quantizing bits of the broad-range image data becomes equal to a number of quantizing bits of the narrow-range image data, and said step of inversely transforming comprises the sub-step of adding ZERO bits to a lowermost quantizing bit of the narrow-range image data until the number of quantizing bits of the narrow-range image data becomes equal to a number of quantizing bits of the broad-range image data.

7. A method of processing image data comprising the steps of:
nonlinearly transforming a number of quantizing levels of broad-range image data having a broad dynamic range to a number of quantizing levels of narrow-range image data narrower in dynamic range than the broad-range image data;
reducing the number of quantizing bits of the broad-range image data sequentially from a lowermost bit until the number of quantizing bits of the broad-range image data becomes equal to the number of quantizing bits of the narrow-range image data to thereby output residual upper-bit data;
calculating difference data representative of a difference between the narrow-range image data and the upper-bit data; and
generating a file that relates at least lower-bit data omitted by said step of reducing, information relating the lower-bit data to said step of reducing, the difference data, information relating the difference data to said step of

nonlinearly transforming and the narrow-range image data to one another.

8. The method in accordance with claim 7, further comprising the step of recording the file.

9. The method in accordance with claim 7, wherein the broad-range image data is reproducible by adding the difference data to the narrow-range image data and then adding the lower-bit data as lower bits.

10. An apparatus for recording image data comprising at least one image processing circuitry and a storage, said at least one image processing circuitry comprising:

a transforming circuit for transforming input image data to output image data having a smaller number of quantizing levels than the input image data and feeding the output image data to another image processing circuitry;

an inverse transforming circuit for inversely transforming the output image data to thereby produce inversely transformed image data having a same dynamic range as the input image data; and

a calculating circuit for calculating difference data representative of a difference between the input image data and the output image data;

said at least one image processing circuitry transforming broad-range image data having a broad dynamic range to narrow-range image data narrower in dynamic range than the broad-range image data, and

at least the narrow-range image data, the difference data and information relating the difference data to said transforming circuit being recorded in said storage while being related to one another.

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11. The apparatus in accordance with claim 10, wherein said transforming circuit comprises a linear transforming circuit for linearly transforming a number of quantizing levels of the broad-range image data, and said inverse transforming circuit comprises a linear inverse transforming circuit for linearly, inversely transforming a number of quantizing levels of the narrow-range image data.

12. The apparatus in accordance with claim 10, wherein said transforming circuit comprises a nonlinear transforming circuit for nonlinearly transforming a number of quantizing levels of the broad-range image data, and said inverse transforming circuit comprises a nonlinear inverse transforming circuit for nonlinearly, inversely transforming a number of quantizing levels of the narrow-range image data.

13. The apparatus in accordance with claim 10, wherein said transforming circuit comprises a circuit for reducing a number of quantizing bits of the broad-range image data sequentially from a lowermost bit until the number of quantizing bits of the broad-range image data becomes equal to a number of quantizing bits of the narrow-range image data, and said inverse transforming circuit comprises a circuit for adding ZERO bits to a lowermost quantizing bit of the narrow-range image data until the number of quantizing bits of the narrow-range image data becomes equal to a number of quantizing bits of the broad-range image data.

14. An apparatus for recording image data comprising at least one image processing circuitry and a storage, said at least one image processing circuitry comprising:

a nonlinear transforming circuit for nonlinearly transforming input image data to output image data having a smaller number of quantizing levels than the input image data

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and feeding the output image data to another image processing circuitry;

a reducing circuit for reducing the number of quantizing bits of the input image data sequentially from a lowermost bit until the number of quantizing bits of the broad-range image data becomes equal to the number of quantizing bits of the output image data to thereby output residual upper-bit data; and

a calculating circuit for calculating difference data representative of a difference between the output image data and the upper-bit data;

said at least one image processing circuitry transforming broad-range image data having a broad dynamic range to narrow-range image data narrower in dynamic range than the broad-range image data, and

at least the narrow-range image data, the lower bits omitted by said reducing circuit, information relating the lower bits to said reducing circuit, the difference data and information relating the difference data to said transforming circuit being recorded in said storage while being related to one another.

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